CSE341 – Programming Languages (Fall 2019)
Homework #4
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Part 1: There is another function names *proute* which prints the *route* pretty.

```
?- route(edirne, erzincan).
true ;
false.

?- route(edirne, edremit).
true ;
false.
```

```
?- route(istanbul, X).
X = rize ;
X = van ;
X = ankara ;
X = konya ;
X = antalya ;
X = gaziantep ;
X = van ;
X = ankara ;
X = konya ;
X = antalya ;
X = gaziantep ;
X = rize ;
X = ankara ;
X = konya ;
X = antalya ;
```

```
X = gaziantep ;
X = van ;
X = rize ;
X = gaziantep ;
X = antalya ;
X = konya ;
X = ankara ;
X = van ;
X = rize ;
X = antalya ;
X = gaziantep ;
X = konya ;
X = ankara ;
X = van ;
X = rize ;
X = izmir ;
X = isparta ;
X = burdur ;
false.
```

```
?- proute(istanbul, X).
X = ankara ;
X = antalya ;
X = burdur ;
X = gaziantep ;
X = isparta ;
X = izmir ;
X = konya ;
X = rize ;
X = van ;
false.
```

```
?- proute(X, istanbul).
X = ankara ;
X = antalya ;
X = burdur ;
X = gaziantep ;
X = isparta ;
X = izmir ;
X = konya ;
X = rize ;
X = van.
```

Part 2: The *sroute* function is using *route* function and to find routes and then gets the set of this route. After that, it selects the minimum distance. *sproute* function is using the *proute* function. ***sproute* cannot get 3 undefined variables but *sroute* can.**

```
?- sproute(From, istanbul, Distance).
From = ankara,
Distance = 351.5 ;
From = antalya,
Distance = 482.75 ;
From = burdur,
Distance = 661.95 ;
From = gaziantep,
Distance = 847.42 ;
From = isparta,
Distance = 637.35 ;
From = izmir,
Distance = 328.8 ;
From = konya,
Distance = 578.84 ;
From = rize,
Distance = 967.79 ;
From = van,
Distance = 1262.37.
```

```
?- sroute(istanbul, burdur, Distance).
Distance = 661.95 ;
false.
```

```
?- sroute(istanbul, burdur, Distance).
Distance = 661.95 ;
false.
```

Part 3: All of the functions works accordingly. There is not any conflict or meet in table at the document.

```
?- schedule(a, P, T).
P = z23,
T = 10 ;
P = z11,
T = 12.
```

```
?- usage(207, T).
T = 16 ;
T = 17.
```

```
?- conflict(X, Y).
false.

?- meet(X, Y).
false.
```

Part 4: All of the 4 functions are working correctly.

```
?- element(1, [1,2,3]).
true.

?- element(1, [0,2,3]).
false.
```

```
?- union([1,3], [2,4], X).
X = [1, 3, 2, 4].

?- union([1,3], [2,4], [1,2,3,4]).
false.

?- union([1,3], [2,4], [1,2,4]).
false.
```

```
?- intersect([1,2], [2,3], X).
X = [2].

?- intersect([1,2], [2,3], [2]).
true.

?- intersect([1,2], [2,3], [1]).
false.
```

```
?- equivalent([1,2,3], [2,3,4]).
false.

?- equivalent([1,2,3], [2,3,1]).
true ;
```